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**Making Schools
Career-Focused**

Final Report

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*Paula Hudis
MPR Associates, Inc.
Berkeley, CA*

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U.S. Department of Education
Planning and Evaluation Service
400 Maryland Avenue, SW
Room 6W306
Washington, DC 20202

Project Officer:

David Goodwin

Submitted by:

Mathematica Policy Research, Inc.
P.O. Box 2393
Princeton, NJ 08543-2393
(609) 799-3535

Project Director:

Alan Hershey

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I. INTRODUCTION

Nationwide, school leaders have been addressing the widespread perception that U.S. high schools often fail to prepare students for further education and successful careers. Many schools are expanding learning objectives for students, adopting new instructional strategies, and raising academic standards. Some high schools are organizing all or parts of their curricula around careers, in an effort to help students achieve greater academic success and make better decisions about the future. This new focus has created a hybrid model that marries the broad goal of comprehensive high schools--to prepare students for further education and careers--with the more immediate employment-related objectives of vocational-technical education.

Experiments with this educational model began in the early 1990s with innovative programs in individual high schools, in part as a response to the Carl D. Perkins Vocational and Applied Technology Education Act of 1990. Within a short time, career-focused education became a cornerstone of federal education reform through the School-to-Work Opportunities Act of 1994 (STWOA). By the late 1990s, nearly all American high schools had incorporated some elements of this hybrid educational model, especially comprehensive programs aimed at improving students' awareness of college and career options and understanding of their own career interests (Visher et al. 1998).

Fewer schools, however, have adopted the more far-reaching elements of school reform advanced by the STWOA. In particular, relatively few schools had adopted "career majors," a curriculum structure that extends beyond career awareness activities to include career-related courses combined with structured learning activities in work settings. By 1998, only about 20 percent of high schools had introduced this structure (Visher et al. 1998). Even among these schools, career majors often are not a significant departure from the status quo. They frequently

involve only some students or reflect only marginal curriculum changes, such as adding a few new elective courses. When all students participate, their goal is simply to encourage more career-oriented choices when students plan their class schedules (Hershey et al. 1999).

This report examines a group of American high schools that have embraced career majors as the organizing device for school improvement efforts. The leaders of these schools have made a serious commitment to involving all students in career majors. At these schools, career majors offer students more than expanded career development programs or a few new career-related courses. Instead, they provide an integrated set of courses and workplace activities to help all students gain a broad view of a career area and develop career-related academic and technical skills.

This report addresses three questions about these schools:

1. Why have school leaders settled on schoolwide career-focused education as their primary vehicle for school improvement?
2. How have these career majors evolved as schools attempt to achieve school improvement goals, meet local needs, and weigh the advantages and disadvantages of various career major approaches?
3. What are some key challenges that these schools face in implementing schoolwide career-focused curricula?

The goal of this report is to help policymakers, practitioners, and researchers understand how educators are creating career-focused education models that meet the diverse needs of American high schools. We do not, however, address the impact of these programs on student outcomes, because attributing changes in student performance to particular institutional changes would require an evaluation design of much greater complexity than is possible in this study. The focus of this report is on educators' motivations to adopt schoolwide, career-focused education and how they made that change happen.

This report is part of a large-scale national evaluation of how states and localities are implementing the STWOA. It follows two comprehensive evaluation reports submitted to Congress (Hershey et al. 1997; and Hershey et al. 1999) and a series of annual reports that summarized the activities of local school-to-work (STW) partnerships nationwide (Silverberg 1997; Silverberg and Hulseley 1998; and Hulseley et al. 1999). The evaluation is being conducted under contract to the U.S. Department of Education (ED), with the support of the U.S. Department of Labor and the national School-to-Work office. Mathematica Policy Research, Inc. is prime contractor for the evaluation, with assistance from its subcontractors MPR Associates, Inc. and Decision Information Resources, Inc.

A. STUDY METHODOLOGY AND DATA USED

The five-year national evaluation of STW implementation includes three data collection efforts:

1. Surveys in 1996, 1997, 1998, and 1999 of all local STW partnerships funded under the STWOA, designed to document the characteristics and development of STW partnerships, roles of partnership members, and levels of student participation
2. Site visits in 1996, 1997, and 1999 to eight states and a sample of 32 STW partnerships in these states, designed to document the planning, design, and implementation of STW models in STW partnerships¹
3. Surveys in 1996, 1998, and 2000 of 12th-grade students in the same eight states (plus followups of these students), designed to examine their high school experiences and short-term postsecondary outcomes

¹In 1996 and 1997, site visits also included six partnerships in other states that received direct federal grants.

This report is based on site visits conducted in 1999 to 10 high schools in five of the eight states included in the sample. These 10 high schools were chosen because they met three criteria: (1) they organized their courses and related student activities around careers through a system of career majors; (2) they adopted a career major system that led to significant changes in the curriculum; and (3) all students participated in this career-focused program of study.

Establishing consistent terminology is important here because schools in this study and elsewhere use different names to describe career-focused curricula that are actually very similar. For example, schools in our sample use terms such as “career majors,” “pathways,” “academies,” or “clusters” to describe their framework for career-related learning. Conceptually their curricula are quite similar: they all refer to sequences of courses and related activities—such as job shadows and internships with local businesses—that focus on a broad set of related careers. One goal of these classes and outside activities is to help students learn about and prepare for employment in a broad career area.²

In this report, we use the terms “career major” and “career-focused program” to refer to all forms of education that (1) organize the curriculum around groups of occupations or industries, and (2) restructure the curriculum and pedagogic approach to include occupation-based contextual learning. While we use the same terminology to describe all 10 schools, our discussion of career-major systems later in this report shows that their models exhibit important

²The academies created by some of the schools in this study differ in important ways from the career academies that have now grown into a nationwide network of about 1,500 schools (Kemple and Snipes 2000). Career academies are organized as “schools-within-schools,” in which both students and teachers are clustered together in courses over several years of high school. With only one exception, student and teacher clustering is much less pervasive in the academies included in this study.

similarities and differences. These reflect the trade-offs the schools have made to create configurations that best suit their local needs.

B. SITE SELECTION

Our goal in this study was to identify and describe a group of high schools that are committed to career-focused education for all students. We began site selection with schools that we already knew well from previous visits. In the eight in-depth evaluation states, we also asked state STW directors and local partnership coordinators to nominate other schools with schoolwide career-focused programs. We then conducted telephone interviews with principals at the nominated schools to learn more about the programs, especially their breadth (Do all students participate in career majors?) and their stage of implementation (Have they moved beyond planning to actual implementation?). Finally, we eliminated schools that did not have a schoolwide, career-focused curriculum or that were still only in the planning stages, and settled on 10 high schools for intensive study (Table I.1).

TABLE I.1
DESCRIPTIVE CHARACTERISTICS OF HIGH SCHOOLS IN THE STUDY SAMPLE

School Name/Location	Community Type	School Type	Approximate Enrollment
Brighton High School <i>Boston, MA</i>	Urban	Comprehensive/Choice	1,000
Central High School <i>Louisville, KY</i>	Urban	Magnet	970
David Douglas High School <i>Portland, OR</i>	Urban	Comprehensive	1,800
Daviess County High School <i>Owensboro, KY</i>	Suburban	Comprehensive	1,700
East Boston High School <i>Boston, MA</i>	Urban	Comprehensive/Choice	1,000
Eleanor Roosevelt High School <i>Greenbelt, MD</i>	Suburban	Comprehensive	3,250
Niles High School <i>Niles, MI</i>	Suburban	Comprehensive/Choice	1,050
Queen Anne's County High School <i>Centreville, MD</i>	Rural	Comprehensive	960
Reynolds High School <i>Troutdale, OR</i>	Suburban	Comprehensive	2,050
Turner Technical High School <i>Miami, FL</i>	Urban	Magnet	2,070

II. WHY CAREER-FOCUSED EDUCATION?

Over the past decade, many high schools have restructured, redefined their missions, overhauled their curricula, or otherwise joined the school reform movement. Most of these schools have embraced education reform to achieve two goals: (1) to raise the academic achievement of students, and (2) to encourage more students to pursue postsecondary education. They also generally agree on key indicators of success: lower high school dropout rates, higher achievement test scores, higher rates of transition to and success in postsecondary education, and better employment preparation for students who do not continue their education immediately after high school.

While they largely agree on these goals and desired outcomes, opinions diverge on how to accomplish them. As a result, school reform has taken many paths. Some schools have introduced specific programs, such as new remedial courses, career academies for small numbers of at-risk students, or new approaches to teaching mathematics. These activities typically target particular groups of students or certain parts of the curriculum. Other schools emphasize “site-based management” to engage parents and community members in school decision making. Still others focus on whole-school changes, such as the career major systems described in the rest of this report.

Our discussion with school staff and observation at the 10 study schools suggest that, to varying degrees, three factors led them to restructure their entire school and create a career-focused curriculum for all students:

1. ***A Commitment to Common Learning Goals for All Students.*** Improved academic performance, a broad understanding of career options, and technical skills needed for working and learning
2. ***A Desire to Change Instruction in Ways That Would Help Students Achieve These Goals.*** Introducing contextual learning, integrating students at different achievement levels, creating smaller learning environments, and including adults from outside the school in the instructional process

3. *A Perceived Need to Win Support.* To find an approach to school reform that would appeal to and engage students, parents, and members of the community

A. CAREER MAJORS VIEWED AS PATH TO ACHIEVING LEARNING GOALS

Among the most frequent reasons that school administrators cited for pursuing career-focused school reform was its potential to help them achieve three student learning objectives:

1. Raise student academic achievement in high school and beyond, especially for youths who traditionally concentrate in vocational programs
2. Help all students learn about career options and their own career interests and aptitudes and gain the employability skills necessary for successful entry into the world of work
3. Help students develop the up-to-date technical skills essential for learning and critical for success in the workplace

1. Raising Student Academic Achievement

Many of the study school principals indicated that, in their communities, educators, business leaders, and parents were increasingly concerned that graduates from traditional high schools were not meeting employers' needs for highly skilled employees. Across the country, economic changes had created new demands for employees with a different set of skills. In the Pacific Northwest, for example, academic skills in mathematics, communications, and technology had become important for employees in industries such as forestry and agriculture, where manual skills had long been sufficient for a solid career. Schools like David Douglas High School in Portland, Oregon, and Reynolds High School in nearby Troutdale adopted a career major structure to address these changing skill demands. They turned to career majors as a way to give students the combination of high-level academic and technical skills that employers were demanding in these changing industries.

The schools included in this study are not alone in viewing career-focused school reform as a way to respond to new labor market conditions. In other research as well, concern about a growing

imbalance between employees' skills and employers' needs has emerged as a reason why high schools have been participating in STW-type innovations (Pauly et al. 1994). This study of 16 STW programs in 15 communities also found that educators worried about the large numbers of students who were not completing the high-level academic courses necessary to gain acceptance into postsecondary schools or entry-level employment in technology-related jobs.

Many school administrators in this study wanted to use a career-focused curriculum not only to raise general levels of academic achievement, but also to raise academic standards specifically for students who had traditionally pursued a vocational course of study. At school after school, principals told us that vocational students needed to be challenged to take higher-level academic courses. They viewed career majors--which require a combination of academic and technical courses--as a way to accomplish this goal, while also giving students a framework and skills for career planning. They often saw career majors as a way to eliminate a two-track curriculum--rigorous academics for one group and vocational courses for another--and to offer both high- and low-achieving students a broader menu of academic and vocational courses that would meet their educational and career needs.

Exactly what was it about career majors that educators believed could play such a powerful role in improving student achievement? Many principals in the study schools saw career-focused education as a way to reshape the learning environment in their schools, make the relevance of schooling more apparent, and, thus, enhance students' motivation to learn. They endorsed the idea that when students with low motivation participate in career-focused programs they become more engaged in learning. Recent research also suggests that, when students grasp the connections between what they are learning in the classroom and what they need to know to pursue interesting careers, school can be transformed from drudgery to a more challenging and engaging learning experience. There is now some evidence that at-risk students who participate in career-focused

academies display better attendance, increased academic course taking, lower dropout rates, and a greater likelihood that they will graduate on time (Kemple and Snipes 2000).

2. Helping All Students Learn About Career Options and Gain Employability Skills

Our site visits revealed a widespread concern that many graduates will not succeed if they lack a clear career direction or fail to develop the employability skills necessary to find and keep jobs. In several communities, educators and parents from all socioeconomic backgrounds contrasted the likely success of students who developed a plan and prepared for higher education or employment with the less attractive prospects of students who lacked any career direction while in high school. They also worried about the many students who arrive at college unprepared to choose a program of study based on the careers they might want to pursue.³

When these schools were first seriously considering a career major system, counselors, teachers, parents, and students all shared these concerns about students' lack of a clear career direction and the consequences. For example, at suburban Niles High School, a countywide survey revealed that, for many students, their major aim in high school was "just to get out." These students did not see how their efforts during high school would lead to an educational and career path. At suburban Daviess County High School, nearly 60 percent of graduates were going on to four-year colleges, but only 25 percent were graduating from those colleges. Educators attributed the high college dropout rate in part to students' lack of career direction.

³These parents and educators reflected concerns about college-bound students that are borne out by recent research: a lack of career direction leads some students to drop out of college and others to spend extra time in school searching for the "right" college major (Stasz et al. 1994).

A related learning goal was helping students develop general skills needed for employment success. Every high school emphasized using both classroom activities and workplace experiences--such as job shadows, internships, or service learning--to help students learn the skills necessary to become a valued employee. They recognized that these skills are important in the short term for students who enter the workforce immediately or who work while attending college, and in the longer term for everyone. Through both classroom and workplace activities, students learned resume writing, interviewing skills, and Internet job search strategies. Teachers focused on developing teamwork and communication skills in an array of academic and technical courses to give students the skills that employers consider important, but often find lacking, among newly hired workers.

3. Helping Students Develop Technical Skills for Working and for Learning

The third major learning objective that motivated these schools to adopt a career major system reflects the critical importance of technology-related skills in schools, colleges, and the world of work. School leaders were committed to helping students develop the up-to-date technical skills that are becoming necessary for both learning at school and success in the workplace. As a result, curriculum designers paid close attention to familiarizing students with computers and information technology.

The schools also focused on technologies required in broad industry or occupational areas, most often ones that were prominent in the local economy. They did this by carefully choosing which career majors to offer and by exposing students to career-related technology in both the classroom and the workplace. Table II.1 shows the career majors offered at the 10 high schools in this study and demonstrates both their breadth--which gives students diverse opportunities for career exposure in nearly all major sectors of the economy--and their frequent focus on technology as a way to attract

TABLE II.1
CAREER MAJORS OFFERED AT HIGH SCHOOLS IN THE STUDY SAMPLE

School	Career Majors
Brighton High School	Business and Technology; Health, Law, Government and Public Service; Media, Arts and Communications
Central High School	Business, Medicine/Allied Health; Computer Technology; Legal/Government Services
David Douglas High School	Arts and Communications; Business and Management; Health Sciences; Hospitality, Tourism and Recreation; Industrial and Engineering Systems; Natural Resources; Social and Human Services
Daviess County High School	Agricultural/Industrial Technology; Business; Human Services/Wellness; Liberal Arts; Math/Science; Visual and Performing Arts
East Boston High School	Arts and Communications; Entrepreneurship; Health Professions; TeachBoston (Education); Travel and Tourism
Eleanor Roosevelt High School	Advanced Technology; Arts and Communications; Business Management; Finance and Tourism; Health and Human Services; Law, Global Affairs and Public Service
Niles High School	Business, Engineering/Industrial; Fine Arts and Communications; Health and Human Services
Queen Anne's County High School	Arts and Communications; Biological, Environmental, and Natural Resources Technology; Business Management Systems; Engineering, Mechanical, and Construction Technology; Health and Human Services
Reynolds High School	Arts and Communications; Business Management Systems; Health and Human Resource Systems; Industrial, Engineering and Natural Resource Systems
Turner Technical High School	Agricultural Science; Finance; Health; Applied Business Technology; Industrial Technology; Residential Construction; Public Service/Television Production

students. In particular, at 6 of the 10 schools in the sample, at least one career major explicitly addresses technology in its title.

The schools in this study provide many examples of the prominence of information technology and industry-related technology in career-focused education. The following are examples:

- In 1999, Eleanor Roosevelt High School launched a three-year program to improve technology education by integrating standards from the International Society for Technology Education (ISTE) across the curriculum. According to ISTE, these standards are designed to help teachers prepare students for success in learning, communication, and life skills by addressing six foundation areas: basic technology operations and concepts; social, ethical, and human issues; technology productivity tools; technology communication tools; technology research tools; and technology problem-solving and decision-making tools.
- In the early 1990s, community leaders in Miami, Florida, established a new school--Turner Technical High School--and designed it to meet the academic and technology-related needs of local employers. They established seven career majors: agricultural science, finance, health, applied business technology, industrial technology, residential construction, and public service/television production. All of these majors relate to large and growing industry sectors in South Florida. Graduates of Turner Tech earn a "2-for-1" diploma that meets Florida's academic graduation requirements and also signals to employers that students have completed state-certified, industry-recognized technical training.
- At Queen Anne's County High School, vocational courses included in career majors rely heavily on industry skill standards. These standards include both core technical skills required in broad career clusters, such as engineering, mechanical, and construction technology, and more specific skills needed in individual occupations. Teachers are also using third-party certifications, such as those from the National Institute for Automotive Service Excellence (ASE) and American Welding Society (AWS) to validate the academic and technical content of specific vocational courses.

B. CAREER MAJORS SEEN AS A VEHICLE FOR CHANGING INSTRUCTION

By committing to these new learning goals for students, our study schools recognized that they needed to change not only what they were teaching, but also how students were learning. In particular, to raise academic achievement for students who traditionally did not excel in academic subjects, schools needed to adopt new ways of teaching. Their approaches to

pedagogy took several forms. First, at every school in our study, principals, teachers, and counselors were dedicated to introducing or expanding opportunities for contextual learning and were seeking an appropriate way to make this change. Second, they believed that lower-achieving students could benefit from instruction in mixed-ability groups--where performance expectations are often more demanding and high-achieving students can serve as positive role models. Third, they sought to enhance the social and academic support their schools offered by creating smaller learning environments. Finally, they believed in the value of involving other adults--inside and outside the school--who could support teachers in the instructional process.

Career majors certainly are not the only vehicle for such teaching innovations. These high schools could have changed their curricula in other ways to provide students with opportunities for contextual learning or a broader understanding of career options. For example, students can benefit from applied learning assignments that address social, legal, environmental, or political issues. However, to achieve all the goals that these schools had set for their students simultaneously--high academic achievement, in-depth exposure to career alternatives, and development of career-related technical skills--career majors were deemed the most promising approach.

Administrators, counselors, and teachers we spoke to connected career majors to these strategies for achieving school improvement. Many of them believe that contextual learning approaches, such as those delivered through career-related classroom applications and workplace activities, help struggling students grasp abstract concepts and material. They view career majors as a way to build a bridge between the academic and vocational curricula. Participation in this new curriculum, they had concluded, would entice lower-achieving students into more rigorous academic courses and help college-bound students make better choices about high school courses, possibly college majors, and career aims. They strongly endorse the idea that

smaller learning environments and support from adult mentors at the workplace foster students' academic and emotional development.

According to these educators, they were using career majors to accomplish four specific objectives, each of which is examined below:

- Help teachers develop curriculum materials rich in contextual learning opportunities, either by designing new material or by drawing on the growing body of published career-related curriculum resources
- Give students new course options where they are not segregated by achievement level into academic and vocational tracks, and dispel the common perception that some students can never be successful
- Provide a structure for smaller learning environments that gives students better academic and social support and is linked to career-related instructional content and goals
- Bring adults from the workplace and the community into the education process as mentors, role models, and instructional resources for technical learning

1. Help Teachers Deliver Contextual Learning

Several schools in our study began their reform process by exploring contextual instructional approaches, often before career majors were introduced. They sent teachers to conferences and workshops, worked with state and private consultants, and offered other types of professional development. These activities were aimed at helping teachers understand how to develop students' academic and technical skills through learning in context. After students and teachers responded positively to contextual learning assignments developed in individual classes, school leaders began to explore schoolwide career majors as a tool for broadening the use of such instruction.

The importance of contextual instruction was particularly evident in schools that emphasized school reform as a way to raise academic standards for students who did not plan to attend four-year postsecondary institutions. For example, Queen Anne's County High School has long had a

significant number of low-performing students, as reflected in the school's lower than average performance on the SAT and other tests. School leaders identified contextual, or blended, instruction, as a way to improve academic achievement. As they have created a career majors system, teachers and administrators have been using contextual instruction to bridge the gap in academic content across two groups of career majors: (1) more heavily academic ones that grew out of the former college-prep track (for example, arts and communications; health and human services); and (2) those that had originated from the earlier vocational-technical track (for example, engineering, mechanical and construction technology; business management systems). Teachers began using contextual learning methods in academic courses to help students understand complex academic material. For example, in welding and agricultural science courses, which are part of mechanical and construction technology, English and mathematics teachers collaborated with their vocational colleagues to develop student assignments. They also began team teaching and introduced academic concepts through career-related assignments. At David Douglas High School, the principal and several teachers stressed that career majors were attractive because they make academic content more relevant and accessible, especially for students who have had little academic success.

While educators at the study schools frequently mentioned the benefits of contextual learning through integrated academic and technical instruction as a reason for adopting schoolwide career majors, their schools have made varying degrees of progress. In schools like Queen Anne's County, Eleanor Roosevelt, and Turner Tech, integration typically involves academic and vocational teachers using collaborative curriculum planning and team teaching, and requiring students to complete assignments that cut across courses with related learning objectives. In these schools, instructional integration appears to be a cornerstone of the career major system. At other schools, teachers engage in joint planning within their career areas, but

still have not developed substantive connections or coordinated learning objectives across courses.

2. Give Students Additional Course Options in Mixed-Ability Groups

As educators at several study schools explored instructional practices that might improve the performance of low-achieving students, they decided to use career majors to eliminate “tracking.” Specifically, these schools stopped (1) grouping students into tracks according to perceived academic ability, and (2) offering different sets of courses to students in these various tracks. They took this action because of research showing that tracking students into separate curricula fails to enhance the academic progress of either higher- or lower-achieving students (Oakes and Lipton 1990). Several of the schools had traditionally divided their students into college-prep and vocational tracks.

As attitudes about tracking changed, these schools viewed career majors as an effective way to restructure, offering more equal educational opportunities and preparing more students for high-skill, high-paying jobs. Students would spend more time in mixed-ability classes, where higher expectations for academic achievement would help motivate low-performing students. To meet career major requirements, lower-achieving students would be able to choose new courses that offered academic as well as technical material. At the same time, college-bound students could select technical courses that, for the first time, would enhance their preparation for college because they would also include academic learning goals.

The move away from a tracked curriculum has not always been quick or easy. The long history of tracking has made it an almost indelible part of the landscape at many high schools. At Queen Anne’s County High School, for example, the transition from a tracked system to schoolwide career majors was a two-step process that spanned almost a decade. In the first transitional phase, from 1990 to 1996, vocational education was called “tech-prep,” as high

school and postsecondary administrators sought to increase the postsecondary enrollments of vocational students. The tech-prep curriculum was built on higher academic and technical standards than the old vocational courses and included a strong computer technology component. However, the tech-prep curriculum was still separate from, and less rigorous than, the college-prep program.

In 1996, Queen Anne's County began preparing for a fully integrated tech-prep/academic curriculum that ultimately enrolled all ninth-grade students in 1998–1999. The school created five career majors. At first, there was little change in the achievement levels of students in these career majors. Three of them (business management systems; engineering, mechanical, and construction technology; and health and human services) mainly attracted students who had previously enrolled in the tech-prep curriculum, and two (arts and communications; and biological, environmental, and natural resources technology) mainly enrolled students from the former college-prep group. However, more recently, a diverse mix of students--including those bound for college and those preparing for immediate entry into the workforce--participate in each career major, creating a more heterogeneous mix of abilities in classes.

At Daviess County High School, the traditional curriculum structure was similar to that at Queen Anne's County, and school administrators saw the same educational disadvantages. Students were grouped into vocational and college-prep tracks that set quite different expectations. The principal and other administrators observed that many students in vocational classes were not being challenged; the curriculum made no pretense of preparing them for a four-year college or university. The school leaders believed that many of these students were not working to their potential, and adopted a career major structure to eliminate the two-track system, raise academic standards, and challenge all students to do college-prep work. To some extent, the new career major system still separates students by academic achievement, especially

in higher-level academic courses. However, students now have more opportunities to learn in mixed-ability, career-related courses and to move into more rigorous courses if they are prepared to do so.

3. Create Smaller, More Supportive Learning Environments

Researchers and school reformers have supported the idea of creating smaller learning environments to improve student learning (Klonsky 1995; Raywid 1995; and Cadweli 1999). This strategy involves breaking up large high schools with thousands of students into smaller units of a few hundred students each to create an atmosphere that resembles a much smaller school. Studies of small learning environments have shown that they positively affect student academic outcomes, such as grades, test scores, and performance in specific subjects (Raywid 1995; Klonsky 1995; Meier 1995a; Meier 1995b; and Lee et al. 1993). Research has also suggested a link between educating at-risk students in smaller groups and other behavioral outcomes, such as better attendance, that may ultimately lead to higher achievement (Kemple and Snipes 2000). At several schools in our study, educators emphasized that they had instituted schoolwide career majors in part to create a framework for smaller learning environments.

How do smaller learning environments influence student learning, and what are the advantages of creating them through a career major structure? The potential effects of smaller learning environments on student achievement are twofold. They may be direct, by increasing teachers' knowledge of students' individual learning styles, or indirect, by helping teachers implement other school reform strategies (Visser and Hudis 1999). Both effects were important to educators at several schools in this study. They believed that, in smaller learning environments, teachers do a better job of monitoring students' academic progress and tailoring assignments to meet individual student needs. A small-school environment may produce a more

family-like atmosphere in which teachers and students can communicate better about academic and personal issues that may affect academic performance.

Teachers in these schools also highlighted the importance of the indirect effects of smaller learning environments. They indicated that, when students are grouped into these smaller, more cohesive units, teachers are better able to implement new teaching approaches, including contextual and cooperative learning strategies. For example, teachers in the same career major area can use common planning time to collaborate on contextual learning assignments, such as senior projects, in which students develop both academic and technical skills through work-related applications.

In some of the relatively large schools in our study, like Turner Tech, East Boston, and Brighton High School, “smaller is better” was a central factor in the decision to implement career majors. Administrators were looking for a way to implement this approach as a key element of school reform. They could have simply divided the school into subunits and assigned students and teachers to the individual parts; this would have allowed them to cluster students and give them ongoing contact with each other and with a group of teachers. Creating these subunits--or schools-within-schools--could have created an educational environment that resembled a much smaller high school. However, these educators chose to create smaller learning environments through career majors so that they could meet other instructional goals: to expand opportunities for contextual learning and to improve students’ knowledge about careers.

Our site visits indicated that schools that embrace smaller learning environments and career majors for all students vary in their approaches. For example, at Central High School in Louisville, Kentucky, school leaders combine two methods for creating small learning environments. First, all ninth-grade students are assigned to groups that are not organized around career majors. However, students share the same mathematics, science, social studies,

and English teachers. As students make the important, and often difficult, transition to high school, these small-group arrangements help students get to know each other and help teachers share information about students' progress and problems. Thus, students get the benefits of a smaller learning environment even before they select a career major. In later grades, groups of students participate in the same career-related courses that build the foundation for ongoing contact between students and teachers.

Creating small learning environments around career majors is not always simple. At Reynolds High School, administrators ultimately plan to cluster students by career major into both technical and academic classes. At the time of the site visit, they had not yet been able to do so, however, largely because of overcrowding and scheduling difficulties. Consequently, they took a first step toward creating smaller learning environments by assigning students in grades 9 and 10 to one of four "houses," where they keep the same academic teachers for two years. Students in each house have a counselor who stays with them throughout their high school years. As part of the house structure, teachers have joint planning periods that allow them to monitor and discuss the academic progress of students in their houses and to confer with counselors who get to know these students well.

School leaders at Reynolds have been facing some of the typical challenges associated with creating smaller learning environments. These challenges reflect the trade-offs that must be made when using career majors, rather than other methods, to create these small learning environments. In Section C of this report, we discuss these trade-offs and challenges and how schools in our study resolved them.

4. Bring a More Diverse Group of Adults into the Instructional Effort

All the schools in our study have recognized that bringing adults from the workplace and the community into the learning process can be a valuable adjunct to classroom instruction. These

adults can perform many important functions. They can serve as role models who demonstrate employability skills, mentors who encourage students to stay in school and strive for high academic achievement, and advisers who help students develop academic and, especially, technical skills. While the specific roles that adults outside of school assume in the instructional process vary, they have one thing in common. They widen the circle of individuals who are concerned with students' academic success and help create a social support system for students.

Educators at some study schools pointed out the value of bringing adults who are not classroom teachers into the instructional process through carefully structured roles linked directly or indirectly to career majors. At Brighton High School, for example, the headmaster cited giving students exposure to adult professionals as one of the three main reasons for taking a "total school-to-careers" approach. The school uses guest speakers, special events at the school, worksite visits, and internships as venues in which adults can motivate students and increase their career awareness. At East Boston High, staff from the local Private Industry Council (PIC) conduct workshops on professionalism, interviewing skills, and resume writing. The staff members also help students identify internships and paid jobs and serve as liaisons between students and employers. However, they frequently go beyond these assigned roles to act as supportive adults who help individual students explore job possibilities or complete college applications.

At Daviess County High School, the connection between outside adults and the career major system is sometimes indirect, but no less important. The school has set up a mentoring system that requires every student to have two mentors. A member of the school's staff (usually not one of the student's teachers) serves as an adviser, providing guidance on course scheduling and communicating with parents. A community-based mentor, chosen by the student, provides additional support with career and personal counseling. Both adults work with each student

throughout the entire four years of high school. During this time, they have many opportunities to emphasize the importance of working hard at school and of developing strong employability skills. In this type of program, students receive guidance from adult mentors about general educational and career planning; however, the program only connects them to a particular career major if students explicitly pick the mentors because of the career areas in which they work. While some students use these mentoring opportunities to make these career contacts, others do not.

C. CAREER MAJORS CAN HELP GENERATE SUPPORT FOR BROAD SCHOOL REFORM

Parents and teachers often consider their own school experiences as models for education of today's youth. As a result, it can be difficult for schools to shift away from the traditional model of a comprehensive high school. Building support among parents, teachers, students, and the community at large for broad education reform was an important initial objective for the schools in this study. Several schools found that the vision of a system of schoolwide career majors helped them gain this support. They were able to capitalize on well-received earlier experiments with small career-focused programs, such as single academies, and expand these efforts schoolwide. Others, in districts that have adopted public school choice, used their career-focused curriculum to create a competitive advantage in gaining support from parents and students.

1. Build on Earlier Small-Scale Experiments

Many of the sample schools had previously experimented with limited career-focused programs, through either magnets or academies, and they were encouraged by the results. They had already invested time and other resources to modify their curricula so that some students could participate in career majors while others continued with a more traditional class schedule.

Parents and teachers responded positively, as did the students, whose participation in these programs grew over time.

Two study schools had introduced magnet programs several years before they adopted schoolwide career majors. In 1986, Central High School in Louisville, Kentucky, created four career magnet programs for about one-third of the school's student body. According to administrators and teachers, these programs were so successful that students were clamoring to participate. As a result, a new principal was hired in 1990 to expand the magnet program, and the school adopted a complete magnet structure in 1993.

The original magnet program at Eleanor Roosevelt High School in Greenbelt, Maryland, about 14 miles from Washington, DC, began even earlier than the one at Central. In 1976, the school became a magnet for science and technology education under the state's Foundation Academy program. The Foundation Academy attracted students through its high academic standards, opportunities for industry-supported internships, and statewide reputation. Five additional academies (career majors) were added at Eleanor Roosevelt in 1997.

Two other schools in our sample introduced limited career-focused programs--in the form of career academies--as a precursor to adopting a schoolwide career major system. East Boston High School started its Travel and Tourism Academy in 1990 and its Health Academy in 1994. Brighton High School, as one of the first Boston schools to participate in the "Protech" school-to-work initiative, started a Protech Health Academy in 1991 and a business academy in 1995. In both Boston schools, administrators cited the early academies' success in attracting and engaging students as a reason for later adopting a schoolwide career major structure.

Enthusiasm for these early magnets and academies came not only from educators, parents, and students, but also from local employers. Their involvement in these initiatives broadened support for related school reforms. In Boston and Louisville, for example, employers had been

key partners in early experiments with academies. These efforts received broad media coverage that sent a positive message to the community about the value of career-focused school reform.

2. Gain Competitive Advantage

Although the nation remains divided on the issue of school choice, this approach to school reform has been pivotal in decisions about career majors at some schools for several years. Some of the study schools are located in states or districts that have already adopted public school choice. Students in these areas can enroll in any school in their district or, in one case, even in neighboring school districts. School choice has added a new dimension to how these schools are making decisions about school programs and curricula. It has led some of them to view a career-focused curriculum as a marketing tool--a way to attract students who might otherwise attend other schools.

In the early 1990s, Michigan instituted a “Schools of Choice” policy that allows students to attend any district school or schools in neighboring communities. Niles High School, in the southwestern part of the state, began to lose enrollment, and administrators concluded that they needed to change their educational approach to retain and attract students. In 1992, the district’s superintendent established a School Improvement Team (SIT) that met for two years, surveyed students and staff, and visited schools throughout the country that had career-focused curricula. As a result, the SIT recommended raising graduation requirements and introducing schoolwide career majors as a way to raise standards and boost enrollment.

Boston public schools have adopted an open-enrollment policy across the district. The district’s superintendent strongly supported STW-type education reforms and encouraged schools to adopt this approach. In response, many schools, including East Boston, have already done so. School administrators believe that East Boston’s career-focused curriculum has attracted students and parents, especially those who want a career focus not present at their

neighborhood high school. The STW director believes that adopting schoolwide career majors is an effective recruitment tool, but that its success hinges on parents being able to choose between schools with comprehensive career major programs and other district schools with more traditional curricula.

Both the Louisville and Miami school districts also offer students public school choice. Within these districts, schools like Central High School and Turner Tech have used a career-focused curriculum to differentiate themselves from traditional comprehensive high schools and to attract a diverse group of students. Both schools have been highly successful in this competitive admissions environment. Central reportedly receives between 600 and 800 applications per year and accepts slightly more than 300 applicants. In 1997–1998, Turner Tech received about 2,500 applications for admission and only accepted 500 applicants.

III. WHAT DO CAREER MAJOR STRUCTURES LOOK LIKE?

As leaders of these 10 schools designed their career majors structure, they needed to make many decisions. In department meetings, cross-departmental task forces, and full faculty meetings, they talked about creating new courses, course sequences, graduation requirements, and certificates that might be elements of the new career major system. They focused on many of the “nuts-and-bolts” curriculum issues--such as how to prepare students to make career major choices, how many academic and technical courses should be included in career majors, and whether and how students should be clustered together in sequences of career major courses.

In making their decisions, educators asked themselves three questions:

1. How can schools most effectively deliver broad career exposure to all students?
2. To what extent should every student’s high school experience include developing career-related technical skills, and how much weight should be given to specific technical skills, as opposed to broad career exposure?
3. How essential is it to create small learning environments, what do they contribute to the career major system, and how do these environments affect other aspects of the curriculum?

Educators’ responses to these questions clearly reflected their philosophies about educational methods and goals.

This section of the report describes the career major structures that emerged in response to these questions and identifies their key features. It looks closely at several dimensions of career major systems and how they relate to decisions about introducing new career development courses, the relative importance of career-related technical skills, and the value of creating small learning environments.

A. WHAT ARE THE BEST VEHICLES FOR CAREER DEVELOPMENT ACTIVITIES?

Career development opportunities are a key mechanism for introducing students to career majors. At every school, educators decided to use a mix of school-based and workplace activities to expose students to the world of work. They either developed or continued to offer at least one career development course that served as the core of these classroom and outside activities. In these classes, students received broad exposure to all sectors of the economy, developed an understanding of career pathways, and had opportunities to identify their own career-related interests and aptitudes. Principals, teachers, and counselors strongly believed that these courses should teach students employability skills and prepare them to make decisions about career majors. As a result, in these courses--which are generally offered in the ninth grade--students typically complete interest inventories, prepare resumes, create an academic and career plan, and frequently participate in job shadowing.⁴

Career development courses are not unique to schools that use a career major system. They are available at many American high schools and are one of the most widely supported and adopted elements of STW education reforms (Hershey et al. 1999; and Visser et al. 1998). However, these exploratory courses are especially important at schools with schoolwide career majors, where these courses became one of the first building blocks of the career major system.

Why are these courses crucial? For one thing, nearly every school in this study requires students to complete a career major to graduate. In addition, all of these schools allow students

⁴However, some school districts are now developing several of these activities in middle schools and are using ninth-grade career development courses to focus more heavily on the difficult transition from middle school to high school.

to change career majors as they progress through high school, and, in a few schools, students can change their major annually. However, if students repeatedly change their major, there may be negative academic consequences. Making good decisions is therefore important. Because educators want all students to make good choices when they initially pick a career major, it is important for students to learn about their options, the course selections they imply, and the broad career avenues they can lead to. Career development courses serve this function.

The following are examples of the required career development courses that the study schools offer to support their career major programs:

- ***“Freshman Connections” Class at Niles High School.*** Students rotate through this ninth-grade class with a “home base” teacher and about a dozen other participating teachers, each covering particular units. The home base teacher guides students through a “Pathways Book.” Other teachers cover topics such as managing conflict, celebrating diversity, the “art” of learning, career choices, career counseling, morals and manners, leadership through cooperation, and “mathematics--who needs it?”
- ***The “Focus” Course at Reynolds High School.*** This ninth-grade curriculum concentrates on supporting the career major system and the Oregon Career-Related Learning Standards. Topics include personal management, problem solving, teamwork, communications, organization and systems, employment foundations, and career development. The course includes resume writing, career interest assessments, development of a four-year plan, and independent activities that later become part of a career portfolio.
- ***A Rotational Career Development Course And Activities Integrated into Academic Classes.*** At Central High School, students take a career development course, with three weeks in each of 10 rotations that introduce them to the school’s career majors. All ninth-grade students are divided into groups that have the same mathematics, science, social studies, and English teachers. Each group of freshman teachers has a common planning period, in which the group plans lessons around a central theme. Recently, the theme emphasized a river project in which students learned academic, personal development, and employability skills.

B. HOW IMPORTANT IS TECHNICAL SKILL DEVELOPMENT FOR HIGH SCHOOL STUDENTS?

When schools decide to implement career majors, they often define three key learning goals: (1) raise student achievement, (2) help all students learn about their career interests and

options, and (3) encourage all students to develop the technical skills necessary for employment. At all 10 of the schools, the educators fully agreed about the critical importance of the first two goals. However, not every school placed equal emphasis on the third.

This issue--and the inherent trade-offs--led educators to address important design considerations early in their work. They had to determine whether, and how much, their curricula should emphasize specific occupational skills and, as a result, how much their new career major system should diverge from the traditional model of a comprehensive high school. Ultimately, these teachers, counselors, and administrators were asking the same questions: Should all students participate in career majors that impart technical skills and knowledge related to a particular career area? Or should career major courses and outside activities serve primarily as a vehicle for contextual learning of academic material, general knowledge about an industry, and broad exposure to the world of work?

As they made these decisions, the educators grappled with the following more specific questions about how much to emphasize technical skill development:

- Should the curriculum emphasize broadly defined career or industry areas, such as health sciences or natural resource management, with many students receiving only broad career exposure through introductory-level survey courses? Or should all students also complete courses related to an occupation within that area, such as nursing or horticulture, and acquire occupation-specific skills?
- Should completing a career major signal to employers that students have finished a limited number of general requirements or a comprehensive, integrated set of courses and other activities, including both academic and technical courses directly related to a career area?
- Should students be required, or encouraged, to stick to a career major plan once they make it? Or should they have abundant opportunities to change their major?

Inherent in these issues is a set of trade-offs central to the question of how much emphasis high schools should place on having all students develop career-related technical skills. Across the country, this fundamental question often polarizes parents, teachers, and community

members into groups of career major supporters and opponents. Answers to this question determine whether students start their career majors early or later in high school, how many courses constitute a career major, whether majors include highly prescribed academic and technical courses, and how much flexibility students have in completing majors.

1. Organizing Around Broad Industry Areas Versus Specific Occupations

Structuring career majors around broad industry or occupational areas, rather than specific occupations, has several advantages. Schools that use this approach can accommodate students with a wide variety of career aspirations, ranging from career paths that require little or no postsecondary education to those requiring postcollege preparation. This kind of career major system is appealing, whether or not students plan to attend college. Its general, introductory-level courses provide a gateway into either technical vocational classes or the higher-level academic classes that lead to postsecondary education. For this reason, career majors that focus on broad occupational areas are most attractive to college-bound students and their parents, who often reject the vocational character of career majors that focus on specific occupations.

This approach can also have some disadvantages. When career majors do not include a specific occupational focus, most students are likely to develop only limited technical skills. As a result, completing a career major may not completely satisfy local employers who are looking for technically prepared entry-level workers. Nor will these courses generally offer students the best preparation for entering the workforce after high school graduation. Of course, to develop occupation-specific skills that are not part of career major courses, students can still complete a vocational sequence, if it is available at their high school or a local community college. However, low vocational enrollments in high schools (U.S. Department of Education 2000) suggest that, with rising academic standards, it may be difficult for many students to complete

the growing number of academic requirements and career major courses and also take a series of occupation-specific vocational electives.

Finally, when career majors include occupation-specific courses, there is a strong basis for course articulation with community college occupational programs and connections between high school teachers and college faculty. These are valuable resources for instructional improvement, which is less likely to occur when career majors focus only on broad occupational areas.

2. Requiring Few Versus Many Courses to Complete a Career Major

As states and districts increase academic graduation requirements, school staff and students have become less receptive to school reforms that add other new requirements. Thus, schools have often sought to minimize the number of required career major courses. Students appreciate having more options, and limiting the extent of career major requirements makes it easier for counselors to create students' schedules. Even more important, requiring fewer courses allows more students to complete career majors, because a short list of requirements accommodates students who fail some courses or who start a career major sequence later in high school. Highly motivated students and those who are undecided about a career path can actually complete more than one career major before they graduate.

Career majors can specify that students complete a certain number of credits in technical and/or academic courses, without specifying particular courses. For example, students may be required to take one, two, or three technical or career competency courses in a major and any three or four science, mathematics, and language arts courses. Alternatively, a major sequence can include specific, prescribed academic and technical courses, such as chemistry and anatomy/physiology for health occupations students, or accounting and technical communications for business majors. When a career major structure is organized around

numbers of credits, rather than specific courses, students have substantial course and scheduling flexibility. A credit-based system is attractive to students who are undecided about a career major and want to explore an array of courses that go beyond the likely boundaries of more explicitly defined sequences. In addition, this system benefits students who transfer into a school and may not have enough time left to take a long list of required courses and still graduate with the rest of their class.

This flexible career major structure has several drawbacks, however. First, where students have broader course options, it is more difficult to establish coherent student clusters. This diminishes some of the smaller-school environment benefits of career majors. Second, when there is less clustering, it is more difficult for teachers to connect the content of their class material and assignments to students' career interests. Finally, when students have broad flexibility in choosing courses that meet career major requirements, they are less likely to develop a coherent set of technical skills. As a result, employment preparation may not be ideal for those who immediately enter the world of work.

3. Allowing Flexibility to Change Majors Versus Discouraging Changes

Opportunities to change career majors help students who are undecided about their career interests or are dissatisfied with their original choice. For example, a student may find that courses in one career major are not challenging enough and that courses included in other majors are more appealing. Group interviews with students at a few schools in this study indicated that some career majors attract a larger proportion of college-bound students than do others. These classes, which tend to be more challenging, are magnets that draw more highly motivated students away from their initial career major choice. After taking one or two career major courses, many students determine that they have not made the best choice. When they have the flexibility to change, they can still select an alternative major and complete it before graduation.

A flexible career major system has drawbacks for students who frequently change their major. When students make one change early in their high school career, there will be few consequences. However, students who make repeated adjustments may fail to finish a career major sequence within four years and not acquire occupation-related technical skills.

C. WHAT ARE THE COSTS AND BENEFITS OF CAREER-FOCUSED SMALLER LEARNING ENVIRONMENTS?

Smaller learning environments created through career majors hold much promise for both students and teachers. Like smaller learning environments in general, they benefit students by encouraging them to have ongoing contact with a group of teachers and by facilitating their connections with peers so that they can work together on homework and group projects. Assigning teachers to career majors provides a reason for them to collaborate on curriculum issues, helps them develop contextual learning materials, and often creates opportunities for them to acquire solid career-related knowledge. At every school in this study, some teachers, administrators, or counselors highlighted the benefits of small learning environments and the value of using career-focused programs as a way to create them.

The drawbacks of this approach are most likely to surface when schools cluster students together into large sequences of courses and create sharp boundaries around career majors that last throughout students' high school experience. Several of these disadvantages parallel those described previously concerning the trade-offs inherent in career major systems. When schools expect students to stay clustered together in substantial sequences of courses, students' flexibility to change courses and majors is limited. Another disadvantage of this type of clustering is that students transferring into a high school are forced either to enter a sequence in the middle or start at the beginning, and, if they do the latter, they may not complete the entire set of courses before graduation. In addition, clustering students by major into academic and

technical courses can create scheduling dilemmas for students and teachers. Many schools have too few academic teachers--and too few students in a career major--to create an upper-level mathematics, science, or language arts class solely for students in each career major. As described earlier, at Reynolds High School, these scheduling problems led educators to create smaller learning environments only in grades 9 and 10, where they are not connected to career major courses.

The study schools resolved these issues in similar ways. They chose to limit most of the required career major classes to grades 9 and 10. In these grades, students have the greatest need for the social and emotional support that smaller learning environments provide. In addition, during 9th and 10th grades, there are fewer distinctions among the academic courses that students take. As a result, larger numbers of students enroll in specific courses, and schedulers can assign certain sections to individual career majors. For example, if all students in grade 10 take English II, it is relatively easy to assign some sections of this class to each career major. Furthermore, in grades 9 and 10, all students in the major can take the same introductory-level technical course, regardless of their educational and career goals. When several academic courses and one or two technical courses are combined, schools can cluster large numbers of students into smaller learning environments during their first two years of high school. By limiting the number of higher-level academic courses within the career major boundary, schools still have the flexibility to assign students later to academic electives that meet their individual educational and career goals.

IV. CHALLENGES TO CREATING CAREER MAJOR SYSTEMS

In this chapter, we discuss some of the broader challenges that educators at the study schools have faced in implementing schoolwide career majors. These challenges involve generating support for change from diverse stakeholder groups, redesigning an entire curriculum, and ensuring that the new system serves the needs of all students. In many cases, schools have met these challenges, and their approaches may be useful to others planning to introduce schoolwide career majors. In other cases, challenges persist, and continuing evolution of these school reforms is likely.

A. ENLISTING SUPPORT FROM TEACHERS, EMPLOYERS, AND PARENTS

Several schools in this study received immediate, strong support from most stakeholders for adopting a career major system. Introducing career majors even helped some of these schools create a school identity that could attract students who have a choice of which public high school they attend. Other schools, however, faced opposition to, or at least lack of enthusiasm for, introducing schoolwide career majors. Teachers sometimes objected to new schedules, course assignments, the need to collaborate across disciplines, or the philosophy behind career-focused education. In particular, they worried that career-focused education would crowd out important course content unrelated to careers or work, and questioned whether academic courses could be related to careers and still meet high academic standards.

Some community members and four-year postsecondary partners also objected. They did not see much value in this new educational approach, especially for college-bound students. Most of all, some parents feared that career majors would limit, rather than expand, their children's educational and career options. Site visits provided ample evidence of how prevalent

this early opposition was in a number of schools. Even now, in most schools, there are still groups of teachers and parents who are skeptical about the goals and methods of career-focused education.

Interviews with school administrators, teachers, and other staff members also illustrated how these schools overcame opposition or brought key stakeholders on board at the outset. To enlist support for their reforms, the schools used four strategies: applying strong administrative leadership, giving teachers key planning roles, involving employers in program development, and emphasizing high academic standards.

1. Applying Strong Leadership

At nearly every school in this study, strong leadership from a principal and often other key individuals was crucial for successful implementation. These pioneers in career-focused education saw the opportunity to “do something really different” and knew that they would need to spearhead change. In some schools, such as Niles, David Douglas, Daviess County, Turner Tech, and Queen Anne’s County, principals were key in identifying the need for change, although they also relied on support from school district personnel. At Eleanor Roosevelt, the principal led the movement toward career majors at the high school and also led related activities at feeder middle and elementary schools.

In Central and Reynolds, the school board or district launched the career major effort and hired principals who displayed strong leadership qualities and had been successful elsewhere with career-focused education. In Brighton and East Boston, principals were also instrumental in adopting schoolwide career majors. They did not make these decisions entirely by themselves, however; a supportive district superintendent and a district that had endorsed career majors as being essential to school reform provided crucial input.

While leadership from principals was important, other administrators played pivotal roles in putting career major systems in place. At several high schools, STW coordinators who had considerable tenure and influence at their schools became involved with the career major system early and have continued to improve it, particularly by expanding students' opportunities for work-based learning. These individuals were such strong supporters of their principals that other staff often considered them indispensable to achieving broad-based acceptance of school reform.

2. Getting Teachers Involved

Change of this magnitude rarely succeeds when it is simply mandated from the top. Although principals led the effort to identify career majors as the foundation for school reform, they recognized that teachers and other staff members must assume major planning roles. They also recognized that career majors cannot be introduced overnight.

At all of these schools, the planning process was a lengthy one, with significant teacher involvement. For example:

- At Niles High School, the 15-person SIT--consisting of teachers, administrators, and parents--met for two years to identify problems at the school and consider alternative solutions. For another year, they visited schools nationwide that had adopted career-focused education. Finally, for more than a semester, the Site-Based Management Group, consisting of about five teachers, the principal, and the assistant principal, met weekly with the rest of the school staff. They made final decisions about career major requirements, class scheduling, new graduation requirements, work-based learning requirements, and a new career development course.
- At David Douglas High School, teachers formed design teams that were established for each career major. Co-chaired by an educator and a business representative, each team included between 8 and 10 teachers who were responsible for creating the structure and curriculum for each career major. The teams met twice monthly for an entire school year.
- At Brighton High School, the principal established a "change team" consisting of teachers, administrators, and other staff members. The team meets weekly and is responsible for communicating with staff and making recommendations to the school-based management council. This committee decided to use career majors as an approach to creating small learning environments. According to the principal,

because the committee was led by teachers, its members were able to influence their colleagues to support career majors in a way that would have been difficult for the administrators to accomplish by themselves.

3. Involving Employers in the Change Process

Employers are important partners in career major systems. Schools need their support to help develop and validate curricula; participate in career development activities, such as career fairs and job shadowing; and provide work-based learning opportunities, such as internships and career-related jobs. The schools in this study used a broad range of methods to inform employers about their school reform ideas, gather their input, and generate support. In some cases, employers were called upon for their knowledge about occupational skill requirements. Educators then used this information in curriculum development. For example, at Queen Anne's County, employers helped educators identify skill standards for career major courses. At David Douglas, design teams for career majors included and were co-chaired by employer representatives. Serving on these committees exposed employers to the concept of career majors and their benefits.

Other schools launched marketing and informational activities to help employers understand the goals of career major systems and how they worked. For example, Niles High School invited employers to learn about the school by serving as "principal for a day." Daviess County High School began requiring all students to have a community mentor who could help them with educational and career planning activities. Through the experiences of individual students, these employers learned about problems at the school and how career majors might address them. School administrators also invited more than 100 employers annually to attend an informational session at the school about the career major system in general and the required senior passport in particular. Employers were encouraged to ask for senior passports (portfolios) when interviewing job candidates and making hiring decisions.

4. Communicating High Academic Standards

As significant as these efforts were in building support for career majors, none surpassed the importance of showing parents, students, and the community that students in career majors will be held to high academic standards. Parents, in particular, often raised objections to career majors because they feared that their children would face lower standards and would not be prepared for rigorous postsecondary programs. These schools frequently used two related strategies to emphasize high-level academics: (1) requiring academic courses in career major sequences, and (2) connecting career majors to higher graduation requirements.

Including High-Level Academic Courses in Career Major Sequences. Schools in the study differ in the approaches they use to incorporate academic courses into career majors. In several cases, students are required to take specific sequences of courses that include high-level academics as part of a career major. For example, at Queen Anne’s County High School, students are required to complete three credits of mathematics, including one course beyond Algebra II, for every career major. In addition, they must select two of three required science credits from courses in biology, chemistry, or physics. By requiring such high-level academic courses, these schools helped students and parents recognize that career majors can provide effective preparation for both college and work.

Connecting Career Majors to Higher Graduation Requirements. Several schools in the study used a combination of career majors and new class schedules to increase the number of credits required for graduation or to raise the level of required courses. For example, Queen Anne’s County increased graduation requirements from 21 credits to 26. Through block scheduling, students could complete up to 32 credits, and they were encouraged to finish more than the required 26 with a combination of additional academic and technical courses. At Eleanor Roosevelt, students were also required to complete 5 more credits than the 21 that the

state of Maryland demands. To meet these higher credit requirements, each of the school's five academies offers students a substantial number of technical courses and high-level academic courses.

B. REDESIGNING THE CURRICULUM

After a school has determined that a career major system will form the foundation for school reform, administrators, teachers, other school staff members, and community partners must redesign the curriculum. They also must undertake related changes that will make career-focused education a significant departure from their traditional approach. Some key elements of the new system involve developing new courses and course sequences, identifying and connecting learning objectives across courses, and, possibly, arranging students and teachers into career majors. Site visits to our 10 high schools suggest that, to make these curriculum and organizational changes, schools must reorient their thinking about the roles of teachers and counselors, curriculum planning and instruction, and class schedules. In this section, we describe how administrators, teachers, and other staff members at our study schools made the changes necessary to implement career-focused education.

1. Changing the Roles of Teachers and Counselors

One of the most pervasive challenges schools face when they develop career majors is the need to expand the role of teachers and counselors in supporting career-related learning. Traditionally, academic teachers and counselors have rarely helped students learn about careers or develop technical skills. After schools adopted schoolwide career majors, most school staff needed to get involved in classroom and outside activities designed to cultivate students' career-related knowledge.

In some respects, teachers and counselors reversed their professional roles. For example:

- Through the career major system at Daviess County High School, teachers have become involved in helping students plan their course schedules, and they also serve as career and educational counselors.
- At Brighton High School, counselors were assigned to specific career majors. Under this new arrangement, they could collaborate with teachers on career development goals and help create activities that would be part of or connected to classroom instruction.
- At David Douglas High School, academic and vocational teachers actively participated in career development, originally the responsibility of the counseling staff. They started teaching career development courses, helping students choose and develop work-based learning activities in career major courses, and overseeing career-related senior projects.

Although particular changes vary from school to school, in every instance teachers and counselors have broadened their roles to include new responsibilities that they share with their colleagues. Several teachers and counselors have told us that this diversification of roles has added a new, positive dimension to their work lives. It has allowed them to develop better knowledge of students' academic skills and provided students with additional social and emotional support.

2. Giving Teachers Time and Resources for New Planning Activities

Developing a new perspective on how teachers plan instruction was crucial to redesigning the curriculum. In resource-strapped schools, this was a particularly difficult challenge. With traditional approaches, teachers are largely isolated from one another and plan their courses almost entirely by themselves, usually with limited planning time. Career majors require much time- and resource-intensive collaboration on goals, strategies, learning objectives, course content, and student activities. At the study schools, teachers collaborated in several ways, including the following:

- Senior projects, in which students are asked to draw on their experiences from an entire sequence of academic and technical career major courses
- Work-based learning activities, in which learning objectives usually include developing a combination of academic and technical skills
- Integration of academic learning objectives into technical courses, in which teachers collaborate to identify grade-appropriate academic competencies and decide how they can be taught through work-related applications
- Career development courses, for which teachers call upon their academic and vocational colleagues to provide relevant course material and learning activities

Although collaboration is particularly important when schools start curriculum restructuring, it is also beneficial as teachers refine and enhance their courses. To support curriculum planning and teacher collaboration, every study school allocated resources to regular planning meetings at the beginning of implementation. As their systems have matured, most of the schools have continued these sessions. For example, East Boston holds weekly planning meetings for teachers in every career major area. Brighton continues to give teachers three weekly planning periods--which they consider the backbone of the career major system--and Eleanor Roosevelt provides career major teachers with weekly planning times.

These schools have also supported the development of career major systems by allocating resources to professional development in curriculum design and planning. For instance, Eleanor Roosevelt High School and Queen Anne's County High School make extensive use of professional development consultants from the Maryland Department of Education and the Southern Regional Education Board. At Brighton High School, administrators have recruited consultants to work with career major teams at least one day per week on curriculum-related topics. Within the first two years of setting up its career major system, the Miami-Dade School District gave Turner Tech an additional \$500,000 for a daily period devoted to curriculum planning within career majors. Since then, planning time has been reduced, but two faculty meetings per month still help tackle curriculum integration issues.

3. Modifying Class Schedules

Research on school reform has suggested that many problems with high school curricula can be traced to traditional school schedules--usually 45 to 55 minutes spent in seven or eight classes per day (Visser et al. 1998). These short classes present obstacles to key elements of career-focused education, including integrated instruction, career instruction through project and workplace activities, and engaging students in challenging academic courses through contextual learning. Consistent with these views, every school participating in this study has abandoned traditional class scheduling in favor of some kind of block or modified schedule.

At several schools, changing the schedule was the first step toward adopting career majors, and often one of the most difficult ones. Teachers sometimes worried about how they would keep students engaged during long periods. Nevertheless, principals and teachers who were planning career major systems recognized the value of longer periods for project-based learning in the classroom, workplace activities (such as internships), and some activities related to school-based enterprises. As a result, introducing longer periods has become a hallmark of career majors in these and many other schools.

C. ENSURING THAT ALL STUDENTS BENEFIT FROM CAREER MAJORS

Schools that are putting career-focused education into place must meet one more goal: they must ensure that the system is both challenging and flexible enough for all students. If this new approach to education is to raise academic achievement and postgraduation success for all students, it must maintain the delicate balance of recognizing individual differences and preferences, while still setting standards that challenge all students. In structuring their career major systems to achieve this goal, the study schools continue to face two particularly difficult questions:

1. How can broad career majors effectively accommodate and challenge students with different levels of academic achievement and varied career goals?
2. How can the system serve students--many of whom are bound for four-year colleges--who want to “sample” different career majors but are not interested in developing technical skills?

1. Accommodating Differences in Academic Achievement

When the schools in this study created career majors, they planned to do three things for all students: (1) raise academic achievement, (2) help them learn about and explore career options, and (3) help them develop up-to-date technical knowledge and skills. At the same time, these educators had to accommodate variation in students’ academic preparation, achievement, and future plans. The challenge was to create a structure that would meet diverse student needs, while achieving program goals within a framework of high academic standards.

To make careers the basis for a combination of courses across many subjects and at many levels, schools defined their career majors broadly. The breadth of the study schools’ career majors is evident in their titles: most have names such as “business and management,” “arts and communications,” and “health and human services.” These career definitions accommodated the career interests of all students, regardless of their educational and career aspirations. While the titles of nearly all of the career majors are broad, schools adopted two distinct approaches for dealing with heterogeneity in students’ academic achievement.

One group of schools subdivided its career majors into smaller units, with some career majors attracting college-bound students and others attracting students with no plans to attend college. These schools--including Niles, Queen Anne’s County, Daviess County, and Reynolds--created different sequences of courses--with different levels of academic and, sometimes, technical rigor--for each subunit within a career major. For example, at Reynolds High School, the broad industrial, engineering, and natural resource systems career major is divided into four areas of concentration: environmental science, environmental studies,

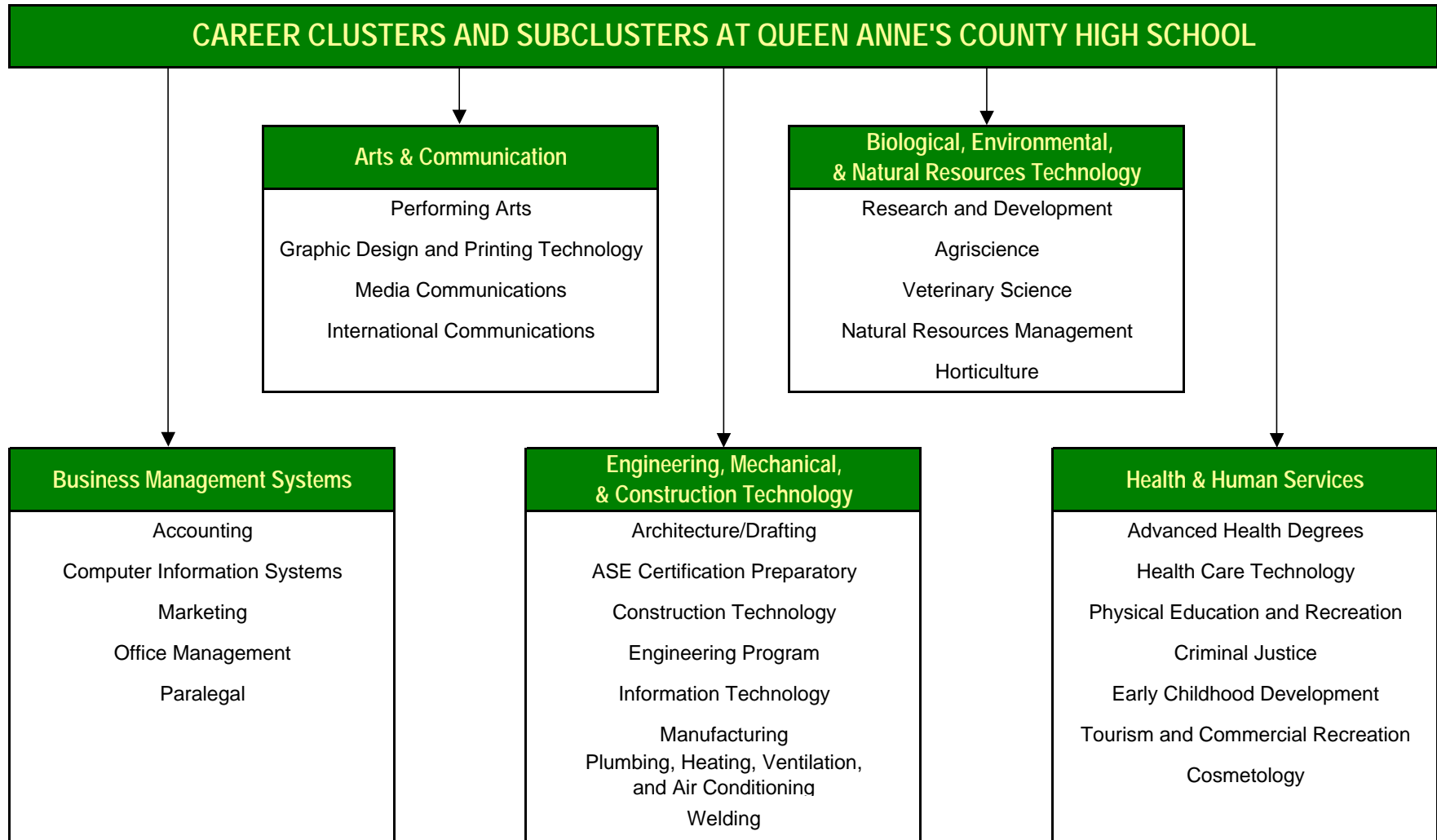
horticultural studies, and horticultural science. One of these, environmental science, is defined as a professional major, while the others are called technical majors. All students in a broad career major take the same exploratory career major course in the 10th grade. However, students enrolled in professional- and technical-level subunits take different academic courses; beginning in school year 2000–2001, they will earn two different diplomas.

The second group of schools--David Douglas, Eleanor Roosevelt, Central, East Boston, Turner Tech, and Brighton--confined their career major systems to a set of broad career majors with no subdivisions. These schools decided to accommodate students' diverse goals and achievement levels by offering many career major electives, especially in academic subjects. Consequently, within majors, students are grouped only in career competency courses and, occasionally, in a few 9th- or 10th-grade academic courses. The 11th and 12th graders have even more latitude in selecting academic and technical elective courses that accommodate their interests and achievement levels.

The following examples illustrate how some of the study schools have created subunits, or subclusters, within their career majors to address students' diverse academic levels and needs:

- Niles High School offers four broad career majors: business, engineering/industrial, fine arts and communications, and health and human services. There are 17 subclusters within the four majors. For example, the business major includes computer information systems, manufacturing technology, and marketing. Within each subcluster, there are two pathways, technical and professional, which have different academic and technical course requirements.
- Queen Anne's County High School offers five career majors: arts and communications; biological, environmental, and natural resources technology; business management systems; engineering, mechanical, and construction technology; and health and human services. These majors are divided into subclusters as shown in Figure IV.1. Course sequences differ substantially at the subcluster level, and there is no common course for all students in the career major area.

FIGURE IV.1



- Daviess County High School offers six career majors that are divided into subunits. Students pick four electives in a subunit to complete a major. Some of the majors include only vocational courses in the list of electives, while others include a mix of academic and technical subjects. The level of academic and technical courses varies across the majors. In addition, the school has four different diplomas to meet students' academic needs: basics (which covers only Kentucky graduation requirements); career preparation; college preparation; and honors. These vary in the number of credits required for graduation, levels of mathematics and science courses, and foreign language requirements.

2. Providing Flexibility with Structure

The discussion above suggests that these 10 high schools have created career major structures that are responsive to students' academic achievement levels and their postgraduation aspirations. In this respect, these systems are flexible. Likewise, the study schools are flexible in allowing students to change career majors, sometimes as often as every year. However, making multiple changes in career majors can conflict with the main purpose of career majors: providing students with a body of knowledge and skills related to a particular career area. To develop more than the most rudimentary knowledge, students must complete a sequence of related courses, rather than confining their course taking to a single entry-level class. To achieve this objective and reinforce the value of the career major experience, nearly all of these schools mandate that students complete a career major as a requirement for graduation.

This requirement creates a conflict for some students--especially those who plan to attend four-year colleges--between sampling different career fields and meeting graduation requirements, when they are not particularly interested in developing a set of career-related technical skills. At several schools we visited, students in this situation indicated that they had chosen a career major solely because its academic requirements prepared them for university entrance, and they were somewhat frustrated about the course limitations that the career major system imposed on them.

Some of these schools have come up with creative strategies for addressing this dilemma. For example, at Eleanor Roosevelt High School, students can complete one career major with six elective credits or combine a four-credit career major from one area with a two-credit minor from another. While this arrangement does not allow unlimited sampling, it does give students some additional flexibility in scheduling. Educators at East Boston High School have taken another approach: students must complete a certain number of career major courses, but not necessarily in one career area. In this career major system, some students may develop only a limited amount of technical knowledge in a single field. However, this system will accommodate college-bound students who are unsure of their career interests but may still benefit from career-related learning.

Other schools have yet to face the dilemma of simultaneously fulfilling two goals: (1) giving students enough flexibility to change and experiment, and (2) fully meeting the objectives of a career major system. Over the past several years, educators at these schools were introducing the career major concept, and full participation was voluntary. These schools have only recently started requiring that students complete a career major in order to graduate. In the years to come, they will be looking for solutions that will serve both of these important goals.

V. SUMMARY AND CONCLUSIONS

In these 10 study high schools, educators have departed in significant ways from “business as usual.” They have a broader vision of what high school should accomplish for all students than do their colleagues in most traditional high schools. For the teachers, counselors, and administrators at our schools, adopting schoolwide career majors has become the path to achieving three goals for students: (1) raising academic achievement, (2) providing an understanding of careers and the world of work, and (3) helping develop technical skills for learning and working. To achieve these goals, educators thought long and hard about how to craft a four-year educational process that would create a strong motivation to learn and increase the likelihood of students’ success in high school and beyond.

Starting from the same basic goals, these schools arrived at career major systems that share many features. Whether they called their new structures academies, career majors, or career pathways, the schools made many of the same modifications to the traditional high school environment. Even though they shared the same general vision, however, the new structures at these schools are not identical. Across all of the schools, leaders agree most on the importance of career planning and development and how to do it through career majors. As a result, every school’s curriculum includes a combination of career development courses, classes that introduce students to broad career areas, and workplace activities that provide a work-related context for learning academic and technical skills.

They also agree strongly on the importance of raising academic achievement and on improvement strategies for doing so. As a result, at every study school, career majors incorporate a combination of required and elective academic courses that encourage and help students to develop high-level academic skills. Many of the schools have also increased the

number of credits required for graduation, often well beyond state and district mandates. They have used the new career major courses, along with alternative scheduling approaches, to help students reach these higher graduation standards.

When it came to the goal of helping students develop technical skills, there was less unanimity and, as a result, less agreement on certain dimensions of career major structures. Every school focused on helping students develop technology skills for learning by including information technology in academic and technical courses. In addition, every school recognized the importance of technology skills for successful employment by exposing students in technical courses to up-to-date career-related technology, either in the classroom or in the workplace. However, some schools clearly place greater emphasis than do others on helping large numbers of students prepare for work immediately after high school. They have translated this view into career majors that are broken down into subunits organized around smaller, occupationally specific clusters. The clusters represent groups of occupations that require different levels of educational preparation. Consequently, depending on the subunits that students select, they receive varying amounts of technical training and enroll in courses at different academic levels.

Why have schools diverged on the issue of how much emphasis to place on helping students develop technical skills? The reasons may be related to differences in philosophy about the scope of what a high school education should be. At some schools, educators have embraced the idea that participating in a career major should help all students prepare for employment immediately after graduation, whether or not they plan to attend college. This perspective led to career majors subdivided into more narrow occupational concentrations and more specialized technical courses that prepare students for these jobs. At other schools, educators seem to believe that this is not a primary role for career majors. Instead, it is to support a broader career development effort, while also providing opportunities to improve teaching and learning. In

particular, they see career majors as a vehicle for helping teachers develop contextual learning material through cross-disciplinary collaboration. Nevertheless, the schools in this second group have not abandoned a traditional high school mission: providing some specialized technical training for some students. These technical courses are still available, but they are not a centerpiece of career major requirements.

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